

WHAT IS CLAIMED IS:

1           1. A method of synchronizing processors in a simulated  
2 multiprocessor environment operable to execute a code portion  
3 to be debugged, comprising the steps:  
4           providing a synchronous breakpoint at a  
5 predetermined address location with respect to said code  
6 portion;  
7           executing said code portion on said processors in  
8 said simulated multiprocessor environment from a fixed  
9 location; and  
10          when a first processor of said processors  
11 encounters said synchronous breakpoint, terminating execution  
12 of said code portion on said first processor while continuing  
13 to execute said code portion on remaining processors.

1           2. The method of synchronizing processors in a  
2 simulated multiprocessor environment as set forth in claim  
3 1, further comprising the steps:

4           when a particular processor of said remaining  
5 processors in said simulated multiprocessor environment  
6 reaches said synchronous breakpoint, terminating execution  
7 of said code portion on said particular processor while  
8 continuing to execute said code portion in said simulated  
9 multiprocessor environment until each of said remaining  
10 processors has reached said synchronous breakpoint; and

11           thereafter, returning run control to a user  
12 associated with said simulated multiprocessor environment.

1           3. The method of synchronizing processors in a  
2 simulated multiprocessor environment as set forth in claim  
3 1, wherein said step of providing a synchronous breakpoint  
4 comprises converting a standard breakpoint into said  
5 synchronous breakpoint.

1           4. The method of synchronizing processors in a  
2 simulated multiprocessor environment as set forth in claim  
3 3, wherein said standard breakpoint is converted into said  
4 synchronous breakpoint by issuing a BREAKPOINT SYNC\_SET  
5 command.

1           5. The method of synchronizing processors in a  
2 simulated multiprocessor environment as set forth in claim  
3 4, further comprising the step of issuing a BREAKPOINT  
4 SYNC\_RELEASE command in order to release said processors from  
5 said synchronous breakpoint.

1           6. The method of synchronizing processors in a  
2 simulated multiprocessor environment as set forth in claim  
3 4, wherein said step of executing said code portion on said  
4 processors is performed in a round robin fashion with respect  
5 to said processors.

1           7. The method of synchronizing processors in a  
2 simulated multiprocessor environment as set forth in claim  
3 4, wherein said code portion is selected from the group  
4 consisting of an application program, a firmware code  
5 portion, a booting sequence, a software tool, and an  
6 operating system, and further wherein said synchronous  
7 breakpoint comprises a breakpoint converted from a standard  
8 breakpoint.

1           8. The method of synchronizing processors in a  
2 simulated multiprocessor environment as set forth in claim  
3 1, wherein a debugger program is operated by said user  
4 associated with said simulated multiprocessor environment.

1           9. The method of synchronizing processors in a  
2 simulated multiprocessor environment as set forth in claim  
3 8, wherein said debugger program is integrated with said  
4 simulated multiprocessor environment.

1           10. A method of debugging a code portion targeted for  
2 execution on a target hardware platform, comprising the steps  
3 of:

4           providing an architectural simulator operable to  
5 simulate said target hardware platform, said architectural  
6 simulator having a debugger associated therewith, wherein  
7 said target hardware platform comprises a multiprocessor  
8 system;

9           initializing in said architectural simulator a list  
10 of processors included in said target hardware platform;

11           setting a synchronous breakpoint at a predetermined  
12 address location with respect to said code portion operable  
13 to be executed on said architectural simulator;

14           launching said code portion on said architectural  
15 simulator from a fixed location;

16           automatically stepping through said list of  
17 processors until each of said processors of said  
18 architectural simulator reaches said synchronous breakpoint;  
19 and

20           thereafter, returning program control to said  
21 debugger for performing a debug operation.

1 11. The method of debugging a code portion targeted for  
2 execution on a target hardware platform as set forth in claim  
3 10, wherein said multiprocessor system comprises a  
4 symmetrical multiprocessor system.

1 12. The method of debugging a code portion targeted for  
2 execution on a target hardware platform as set forth in claim  
3 10, wherein said multiprocessor system comprises an  
4 asymmetrical multiprocessor system.

1 13. The method of debugging a code portion targeted for  
2 execution on a target hardware platform as set forth in claim  
3 10, wherein said multiprocessor system comprises a loosely  
4 coupled multiprocessor system.

1 14. The method of debugging a code portion targeted for  
2 execution on a target hardware platform as set forth in claim  
3 10, wherein said multiprocessor system comprises a tightly  
4 coupled multiprocessor system.

1 15. The method of debugging a code portion targeted for  
2 execution on a target hardware platform as set forth in claim  
3 10, wherein said step of setting a synchronous breakpoint at  
4 a predetermined address location is accomplished by  
5 converting a standard breakpoint into said synchronous  
6 breakpoint upon issuing a BREAKPOINT SYNC\_SET command.

1           16. A system for debugging a code portion targeted for  
2 execution on a target hardware platform, comprising:

3           an architectural simulator operable to simulate  
4 said target hardware platform, said architectural simulator  
5 having a debugger associated therewith, wherein said target  
6 hardware platform comprises a multiprocessor system;

7           means for initializing in said architectural  
8 simulator a list of processors included in said target  
9 hardware platform;

10          means for setting a synchronous breakpoint at a  
11 predetermined address location with respect to said code  
12 portion operable to be executed on said architectural  
13 simulator;

14          means for launching said code portion on said  
15 architectural simulator from a fixed location;

16          means for automatically stepping through said list  
17 of processors until each of said processors of said  
18 architectural simulator reaches said synchronous breakpoint;  
19 and

20          means for returning program control to said  
21 debugger for performing a debug operation after said  
22 processors have reached said synchronous breakpoint.

1           17. The system for debugging a code portion targeted  
2 for execution on a target hardware platform as set forth in  
3 claim 16, wherein said multiprocessor system comprises a  
4 symmetrical multiprocessor system.

1           18. The system for debugging a code portion targeted  
2 for execution on a target hardware platform as set forth in  
3 claim 16, wherein said multiprocessor system comprises an  
4 asymmetrical multiprocessor system.

1           19. The system for debugging a code portion targeted  
2 for execution on a target hardware platform as set forth in  
3 claim 16, wherein said multiprocessor system comprises a  
4 loosely coupled multiprocessor system.

1           20. The system for debugging a code portion targeted  
2 for execution on a target hardware platform as set forth in  
3 claim 16, wherein said multiprocessor system comprises a  
4 tightly coupled multiprocessor system.

1           21. The system for debugging a code portion targeted  
2 for execution on a target hardware platform as set forth in  
3 claim 16, wherein said means for setting a synchronous  
4 breakpoint at a predetermined address location is operable  
5 to convert a standard breakpoint into said synchronous  
6 breakpoint by issuing a BREAKPOINT SYNC\_SET command.